

## THE STUNNING RED-FLOWERED *DROSERA CISTIFLORA* IN THE WILD AND IN CULTIVATION

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*Drosera cistiflora* is a polymorphic winter-growing, spring-flowering sundew from the southwest Cape of South Africa. The general form is a plant with linear or oblong leaves arranged in a rosette, then scattered alternately up a stem that terminates in a few-flowered cluster of stunning, large flowers. The petals color varies from plant to plant, and may be white, pink, creamy yellow, dark purple or scarlet, often with a dark olive-green to grey centre. Following flowering and seed set the plants retreat to a rootstock that consists of two or three succulent roots by which they wait out the summer drought until they send up new leaves and stems the following autumn or winter (Obermeyer 1980). It is thus a sundew an enthusiast could grow for the flowers as well as for the insect-trapping leaves!

In the wild this species ranges along the coast and adjacent ranges of South Africa from Cape Town east to Port Elizabeth; it occurs to the north to Nieuwoudtville on the edge of the semi-desert of Namaqualand (see Figure 1). The typical form has linear leaves and pale pink to white petalled flowers, however around Cape Town and to the north other variants also occur. Noteworthy variants include the following:

1) Plants with rhombic leaves and many-flowered scapes with white or pink flowers. This variant has been called *Drosera helianthemum* Planch. and *D. cistiflora* var. *multiflora* Eckl. et Zeyher (Diels 1906; see Slack 1986: p. 46).

2) Robust pink-petalled plants with oblong leaves that form a large rosette and occur only on the basal third or half of the aerial stem. This variant has been called *Drosera cistiflora* var. *speciosa* (Presl.) Diels.

3) Diminutive plants which may or may not have cauline leaves on the short stem, and bearing flowers that may be white, pink or red. This variant has been called *Drosera zeyheri* (Salter 1940) and red-petalled plants have been described as *D. coccipetala* (Debbert 2002).

4) Plants with linear rosette and stem leaves, and flowers that have stunning dark purple or red petals (see Figure 2) have been called *D. violacea* Willd. Purple-petalled plants of this variant have been called *Drosera rubripetala* (Debbert 1991). It is the red-petalled plants of this variant of *D. cistiflora* that I discuss in the present article.

While visiting South Africa in July 1997 I was taken by Eric Green to see many of these forms in the wild. While it was too early in the season to see many of the plants in flower, I was able to admire more advanced specimens in cultivation in Cape Town. In the wild, *Drosera cistiflora* commonly occurred in well-drained sandy soil and grew apart from all other *Drosera* species, except for *D. trinervia* and *D. alba*. In a few places they grew where water accumulated in the winter. Eric took me to the Ysterfontein Botanical Reserve, near Darling, about 60 km north of Cape Town. This is the best-known place to see the red flowered form of *D. cistiflora*. At the time of my visit the plants had had only recently emerged from dormancy and would need another two months of growth before putting on their stunning floral display. As it was, all that was visible of the plants emerging from the moist clay soil were basal rosettes with few leaves. The vegetation at the site consists of renosterveld: a low herbland or shrubland dominated by fine-leaved members of the daisy family (Manning *et al.* 2002).

I have grown the red flowered form of *Drosera cistiflora* since 2001, and in 2004 I was rewarded for the first time with a flower. This form of the species has linear leaves: in the basal rosette they are up to 15 mm long by 2 mm wide and often terminate with an obtuse apex while the cauline leaves are up to 30 mm long by 1.5 mm wide with an acute end. All the leaves have stalked globose retentive glands on the upper surface. The leaf under surface, stem, peduncle and sepals are covered in minute, short-stalked glands. The tallest plant in my collection has produced a stem 110 mm tall; that was the plant that finally flowered for me. A plant of similar

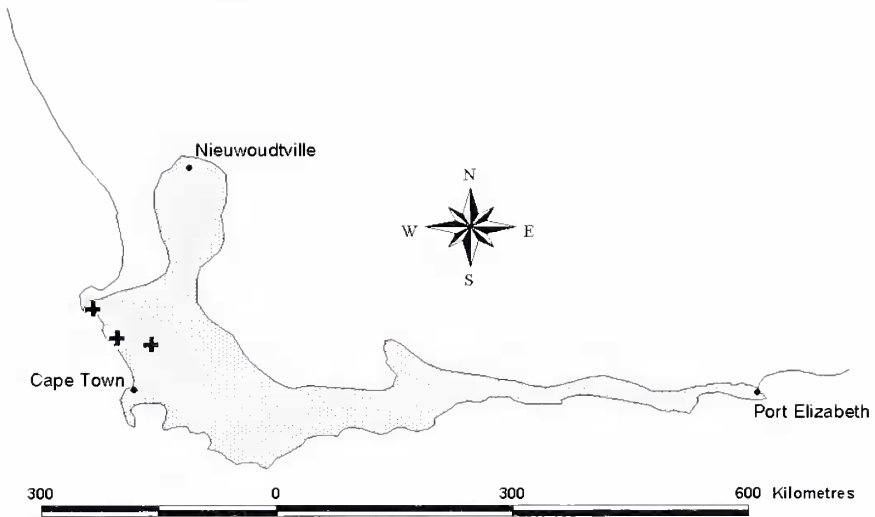


Figure 1: Distribution of *Drosera cistiflora* along the coast and coastal ranges of southern and southwestern South Africa, between Nieuwoudtville and Port Elizabeth. Red-flowered *D. cistiflora* populations are found in the Saldanha—Darling—Hopefield area, indicated on the map by plus signs (+).

dimensions was produced in 2005 and this also yielded flowers.

The flower of this form of *D. cistiflora* is a sight to behold (see Front Cover). The narrowly obovate sepals are up to 11 mm long by 5 mm wide and reflex when the flower is fully open. The petals are obovate with truncate, irregularly dentate margins, and as large as 25 mm long by 17 to 22 mm wide. They are colored a deep scarlet red with an olive-green base. The ovoid ovary is also olive-green and is 4 mm tall by 4 mm in diameter. It is surmounted by three styles that are bifid from the base with ascending free ends. Each style segment is 15 mm long, and is grey-green at the base, translucent in the middle, and red on the apical third. The apical 4 mm of each style segment is multiply-divided into 10 to 20 terete to flabellate style segments. The ovary is surrounded by five erect stamens that have a grey filament 5 mm long, and anthers 1.5 mm long that produce conspicuous orange pollen.

The flower on my *Drosera cistiflora* stayed open for three days and closed each night. Pollen from the anthers was ripe and available early on the first day, and the stigmas appeared to be pollen-receptive at that time too. On the third day, when the outer margins of the petals were beginning to wilt, suggesting the flower's life was coming to an end, I self-pollinated the flower. Over the next few hours the flower began to close for the final time, and the different floral organs retired in a distinctive, orderly sequence. First the styles segments curled inwards until the apices were near vertical, then the petals folded in, to be followed at last by the sepals.

As days turned to weeks, I watched with hope as the ovary enlarged, but since I believed that this species was self-incompatible, due to the amount of resources this species uses to attract pollinators to encourage cross-pollination, I was not optimistic. Five weeks after pollination I harvested the enlarged capsule and obtained approximately 290 black, viable seeds. I was delighted to find that my suspicions of the plant's self-incompatibility were wrong! The seeds were cylindrical to ovoid, up to 0.7 mm long, and had a colliculate surface, i.e. covered in small, rounded protuberances (see Figure 2E).

*Drosera cistiflora* has specific requirements for cultivation, but once these are met it can be easily grown. From my own experience this species is most difficult to keep alive over the summer, while it is dormant. This appears to be best achieved by growing the plants in large pots (over 20 cm diameter) in a mix that is more sand than peat. The pot is placed in a plastic saucer and given the occasional overhead watering in the summer (when the plant was dormant). The soil is kept moist during the growing season (late winter until late spring). During the growing season, the plants can tolerate a mild frost.

New growth breaks the soil surface in midwinter: June and July for growers in the southern

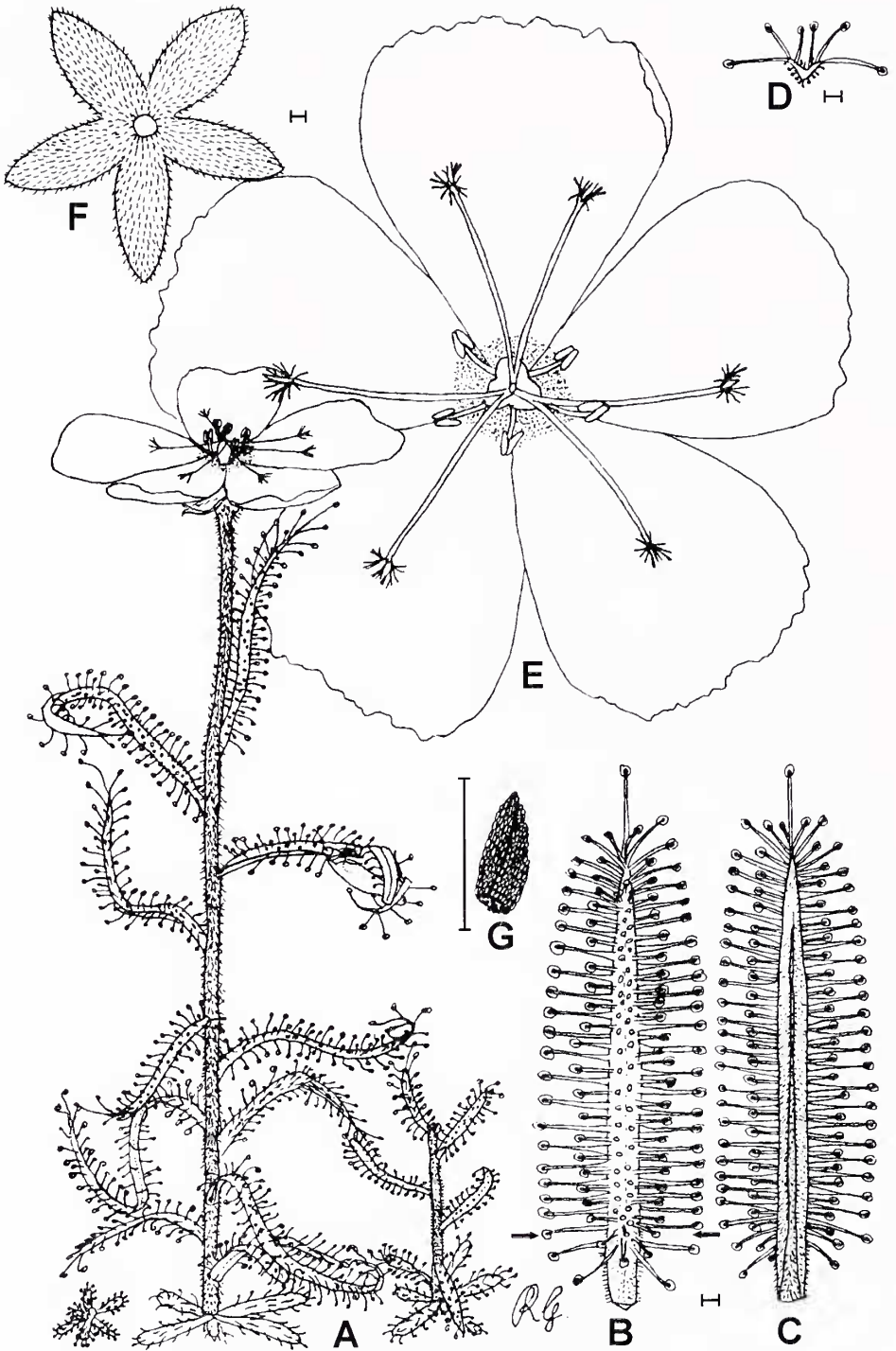


Figure 2: The red-flowered form of *Drosera cistiflora*. A: Habit of the plant; B: leaf upper surface; C: leaf lower surface; D: triangular cross-section of the leaf; E: open flower from above; F: calyx; G: mature seed. Sketch by R. Gibson, 2004. The scale bar represents 1 mm in all cases.

hemisphere (December and January for those in the northern hemisphere<sup>1</sup>). It is easy to become despondent that the *Drosera cistiflora* pot is still showing no sign of life whilst most tuberous *Drosera* are already in active and conspicuous growth. Do not give up, for it appears that this species resumes growth in response to environmental conditions rather than because of a strong internal clock. At first the plant forms a basal rosette, and by early August (February) the plants should form a stem. The cauline leaves are highly mobile and will wrap neatly around larger prey. By late August (February) the lucky grower will detect a spherical flower bud or two in the centre of the apical growing point. The flower buds grow rapidly in September (March) and flowers commonly open in the middle to later parts of that month. Each flower opens in the vertical position, and lasts for three days (see Figure 3). Following anthesis the plant begins to die down to the roots, and this process is commonly completed by November. Ripe seed, if present, is ready to harvest in late October (April).

Plants can be propagated readily. Each plant will commonly produce additional plantlets from the roots, and thus will slowly form a clonal group. New plantlets can also be produced from leaf cuttings, especially when taken early in the growing season. Seed germinates well, especially when fresh, and it too is best sown in autumn or early winter so that seedlings have reached a reasonable size by the time they approach dormancy, and thus have the best chance of surviving their first summer. Plantlets produced by the above methods are particularly susceptible to both desiccation and excessive moisture during the summer dormant period. For best results start them off in large pots and expect some losses. From my experience it appears best to repot this species as actively growing plants early in the growing season. This enables the plants to be watched in the new environment to gauge how suitable it is for them, and also allows the plants to settle in, and develop new thickened roots at an optimum depth in time for the next growing season. The best way to share this stunning form of this species with friends is to send propagules as fresh leaves or young leaf cuttings; these are easy to post and the resulting vigorous plants have a great chance of getting established in time to survive their first dormant season.

In conclusion, it is great to report success in growing the red-flowered *D. cistiflora* and flowering it at last! It was interesting to find that this form forms viable seed when self-pollinated. Both in growth and especially in flower, this spectacular sundew will appeal to most people, especially to carnivorous plant growers accustomed to growing plants only for their carnivorous leaves.

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<sup>1</sup>Of course, I grow my plants in the southern hemisphere, where June-July is midwinter. To aid readers in the northern hemisphere, I include their seasonal information in parentheses.)